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SYPHILITIC GUMMATA OF THE CILIARY BODY.

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We are all familiar with the appearance of nodules or condylomata or gummy tubercles of the iris as seen in syphilitic iritis. They occur in a certain proportion of cases, and are considered as a stamp of specific origin. One or more may appear in the parenchyma of the iris and develop so as to protrude between its fibres. Their vascular covering sometimes gives them a brownish red color, at other times they appear like yellowish circumscribed elevations. They are often absorbed without rupturing, at other times they undergo a purulent or fatty degeneration, but are finally absorbed leaving only a scar in the fibres of the iris.

While this manifestation of syphilis of the eye is familiar to all, the appearance of gummata involving the ciliary body is comparatively rare. They are considered undoubted evidence of specific disease, and come pathologically under the same head as condylomata of the iris just mentioned.

The rarity of this disease has prompted me to present six cases in five persons for your consideration. They occurred in

persons who had previously suffered from syphilis. Four of these five persons belonged to the colored race. They all had specific iritis preceding the development of the gummata in the ciliary body.

In only one of these cases, that of Laura Corbin, did I have an opportunity of watching the development of the ciliary tumor, the others having fully developed previous to their admission into the hospital.

De Wecker, in *Ocular Therapeutics*, says that "gummy irido-choroiditis is an affection which may be justly called unforeseen when it breaks out in the ciliary body. Here within a space of three or four days, a prominence like a staphyloma will appear on the anterior portion of the sclerotic so marked that in cases in which it is seated under the upper lid, one might almost be disposed to believe that previous examinations had not been made with sufficient care."

This was certainly true in this case. In the case reported by Seggel in *Archives of Ophthalmology*, Vol. XI, he says that the projection of the sclerotic developed in a few days; and in the case reported by Drs. Loring and Eno the eye is said to have been destroyed within a day or two.

Case I. Kate Skillman, æt. 27, domestic, single, contracted syphilis three years and a half ago, and has been in the venereal ward several times. She is not well developed and is poorly nourished, and has syphilitic eruptions over her face and body.

She says that last December her eyes became inflamed, and it is evident from the appearance that she had an attack of iritis. The left eye is at present free from inflammation, and her sight is good. The right eye presents the following appearance: there is a yielding or bulging of the upper half of the sclera near the cornea. There are four or five hemispherically shaped nodules side by side. The eye is very sensitive and tender, the pupil is closed by a thick membrane and the iris is discolored. She says that this change in the sclera began about the middle of January.

March 4, I punctured all of the staphylomata as the eye was

painful and the anodyne did not seem to give her relief. They discharged a sanious fluid, and the eye became soft. Warm poultices were then applied, and in two or three days she expressed herself as decidedly better.

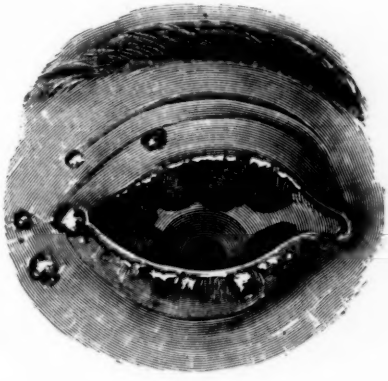

FIG. 5.

In the course of a month the right eye became considerably shrunken, but it was not sensitive to pressure so that enuncleation was not necessary.

CASE II. Ernst Edwards, (colored), ær. 28, laborer, contracted syphilis one year ago which was followed by secondary eruption. He was admitted on account of the inflammation of his left eye and gave the following history:

He says that four weeks ago the eye became very painful and the vision decidedly impaired. A friend examining it found a small elevation in the upper portion of the sclera.

The present indication is that he has been suffering with suppurative iritis, as the chamber is nearly filled with pus.

There is a bulging of the sclera upward and outward in the ciliary region, extending backward almost to the equator, and the tension of the ball is considerably increased. The sclera is vividly injected, and the globe appears slightly ectatic. He has no perception of light and suffers constant and severe pain.

June 30, 1879. Poultices were used and gave great relief, and under their influence the pus in the anterior chamber began to be absorbed.

July 5. Eye more painful. I made a paracentesis of the cornea and evacuated the aqueous and pus, but could not remove a small mass of lymph that adhered to the iris.

July 6 and 8. Anterior chamber again opened. Eye quiet until the 15, when the staphyloma began to increase.

July 20. Eye painful, and sclera below is beginning to bulge in the ciliary region. The upper staphyloma was then freely incised evacuating pus and blood together with a sanious fluid. After this the eye soon atrophied and he was discharged a month later.

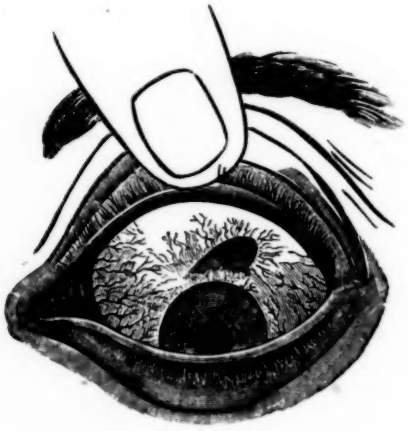

FIG. 6.

CASE III. Elijah Craig, (colored), æt. 26, contracted syphilis a year ago which was followed by secondary eruption. Had an attack of iritis in both eyes several weeks ago and attended the Dispensary for a month past where atropine was used and a specific treatment was given internally. At present the pupil of the right eye dilates, but the left one is bound down by

a number of adhesions. He was ordered atropia for the eyes, bichloride and iodide internally, and for the relief of the pain warm poultices were used. Vision of right eye is good, but that of the left eye reduced to perception of light.

Feb. 10. The right eye very much better, pupil dilated and eye much freer from irritation. The left eye is very painful, with increased intra-ocular tension and deep scleral injection.

In the median line just behind the corneo scleral junction and in front of the superior rectus muscle is a bulging of the sclera. The sclera seems to have thinned at this point, and the intra-ocular pressure has caused a small circumscribed staphyloma somewhat conicle in shape. The upper portion of the iris is pressed forward in contact with the cornea as if from a growth or deposit behind it.

Poultices were applied, but the pain continuing, I punctured the staphyloma Feb. 15, as I had done in the other cases. This gave relief, and the eye became quiet and in time underwent a moderate degree of atrophy.

CASE IV. Laura Corbin, (colored), æt. 18, single, domestic, had syphilis one year ago, and at present has a papular eruption over the entire body. She states that she had inflamed eyes one year ago. She has recently had an attack of plastic iritis from which she made a good recovery, the pupils dilating widely.

She has recently had that form of phlyctenular keratitis which is so persistent in the colored race. Both eyes have been affected and the corneæ are now studded with the scars of the successive crops of phlyctenulæ. She has been taking antisyphilitic treatment ever since she came into the hospital, Nov. 5. 1878. She complains of severe hemicrania which occurs daily in the afternoon. For the relief of this she was ordered sulphate of quinia in liberal doses.

Nov. 30. Eruption of the skin has cleared up, and her eyes are quite free from irritation.

I did not see her again until Dec. 6. In the mean time her right eye had become extremely painful. The pain came on

suddenly three or four days ago, and persisted without intermission in spite of atropine and anodynes.

The change which had taken place in her eyes in so short a time was something which I could scarcely believe. There had developed a small circumscribed staphyloma of the sclera about three inches below the lower border of the cornea in the region of the ciliary body into which the iris had prolapsed. There was no turbidity of the aqueous' but the eye was very sensitive to light and to the slightest pressure, and the tension was moderately increased.

It seemed incredible that this change could have taken place since I last saw her. The onset of the disease was sudden and violent, and it localized itself in the ciliary body, and caused such a thinning of the sclera as to allow the iris to prolapse into it.

I ordered anodynes internally and warm applications until the next day, when I punctured the staphyloma and evacuated its contents, which were principally aqueous, with pus and blood, and ordered eserine.

Dec. 9. Punctured the staphyloma again, as the eye was still painful. Three days later the eye was entirely free from pain. I determined to watch the other eye in case a similar change should begin in it, and accordingly saw her daily.

Dec. 30. The left eye became painful, and the lower portion of the ciliary region was quite sensitive to pressure.

Jan. 2, 1879. Eye very painful and the sclerotic beginning to bulge a little at a point corresponding with the staphyloma of the right eye.

Jan. 4. The sclera pointing in conical shape, and it is quite evident that we will have repeated here what occurred in her right eye. I, therefore, determined to puncture it at once, and evacuated it with Graefe's knife; a drop of pus escaped, the tension of the ball was relieved and the pain very much mitigated. The iris was unchanged in this eye, and there seemed no tendency to prolapse as it did in the right eye.

Jan. 10. Vision very good with the left eye; in the right

eye a dense false membrane has formed in the pupil, and the vision seemed entirely lost.

Jan. 16. Still improving, treatment continued. There has been a general improvement in her condition for several weeks, and she was able to be up and around the ward.

March 13. Vision in her left eye is very good, tension normal and pupil active. There is a small dark discoloration of the sclera at the point where the staphyloma presented, but there is no indrawn cicatrix.

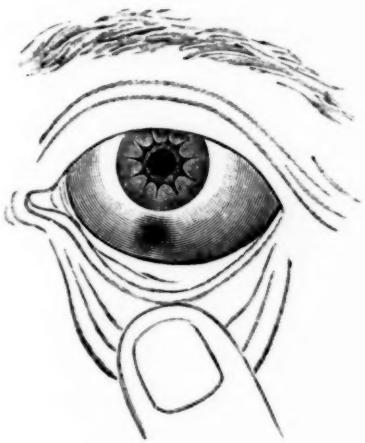

FIG. 7.—Left eye of Laura Coben after recovery. The dark spot in the sclera shows the location of the gumma.

In the right eye there is an extensive discoloration of the sclera below, and marginal opacity of the cornea. The iris is drawn down into the cicatrix, the pupil is closed by a false membrane, the tension is reduced and vision is equal to seeing shadows.

CASE V.—Peter H. Harper, æt. 23 years, colored, occupation, waiter. Physique good and well nourished. He was admitted into the Cincinnati Hospital Jan. 6, 1887.

He states that he contracted syphilis in 1884, and about

four weeks later an eruption appeared on his body. In the spring of 1887 he had a bubo and a specific skin eruption and an attack of iritis of the right eye. Upon admission into the hospital there was well marked plastic iritis with firm posterior synechia. The pupillary area was filled with a dense membrane, and vision was reduced to perception of light.

At the sclero-corneal margin (inner and lower quadrant) is found a swelling the size of a large pea, and below and more externally another, the size of a hemp seed. He has considerable pain and lachrymation, but no marked photophobia. There is great tenderness on pressure, especially in the ciliary region. His entire body and limbs are covered with a pustular eruption uniformly distributed. Gums tender and bleed readily.

He was under specific treatment by inunctions of mercury and potassium iodide until July 15, 1887, when he was discharged.

On the 17th of June the records state that the tumor at the corneo-scleral border had diminished somewhat in size and that the pupil had dilated and the aqueous cleared up considerably.

I saw the patient for the first time on the 16th of July when I made the following notes of the appearance of the eye:

The globe appears slightly shrunken. The outer half of the cornea is slightly vascular, but still transparent enough to allow the iris to be plainly seen. The iris is agglutinated to the lens capsule and the pupil presents a somewhat serrated appearance. The pupillary area is yellowish, as if there was a suppuration going on within the ball. The inner half of the cornea is very vascular, and the iris cannot be seen through it. The elevation of the sclera in the ciliary region begins at the inner side of the superior rectus muscle, and extends inward and downward over the inner half of the eye, and terminates at the outer edge of the insertion of the inferior rectus muscle thus involving one-half of the ciliary zone.

Close to the cornea and marking the beginning of the ciliary elevation is a prominence with very thin outer wall, 2 mm. in

height and 4 mm. in diameter. It is yellowish in color and apparently contains pus. The balance of the elevation is roundish, about 1 mm. in height, and extends from the cornea backward about 8 mm. in breadth. The eye is sensitive to touch and also to ordinary daylight.

He returned to the hospital in a few days with little change in his condition for the better, and as the eye was a constant source of pain and annoyance, it was enucleated Aug. 6 by Dr. Sattler, through whose kindness I have the opportunity of presenting this case.

It was the only case where enucleation was deemed necessary for the comfort of the patient. It is interesting from the great extent of the ciliary staphyloma as it involved over one half of the ciliary zone.

Microscopic Examination.

CASE OF PETER HARPER.

The mass is gummatous in character, consisting of a caseous centre with a more or less distinct capsule surrounding it. The caseous centre is composed of shriveled cells, granular debris, and some fibrous trabeculæ extending inward from capsule. Throughout the caseous mass are scattered numerous pigment granules.

The capsule is fibrous and dense, especially posteriorly, where it seems to be identical with the sclerotic; whilst anteriorly the mass is covered by only a very thin lamina of fibrous tissue and the conjunctiva. At this point the caseous body almost bursts through its capsule. In the fibrous capsule the vessels are undergoing endarteritis obliterans, and are observed in various stages of the process.

All the surrounding tissues have undergone round cell infiltration. This is particularly well marked in the cornea, where the laminæ are more or less separated from one another. The conjunctival epithelium is in a state of proliferation.

In Graefe's Archiv, vol. VIII part 2 (1861) Colberg firs

demonstrates in a specimen furnished by Alfred Graefe the true microscopic character of proliferations in the iris tissue.

In vol. XIII, part 1 of the same (1867) Dr. V. Hippel describes a case where there were two elevations about 1''' below the corneal border. The patient had suffered from syphilis and had had iritis previous to the development of the above mentioned elevations in the ciliary region. In the enucleation the sclera ruptured and a yellowish tolerably thick fluid resembling pus escaped.

Barbar-Zürich describes four cases of undoubted involvement of the ciliary by gummatous growths, two of which terminated in phthisis bulbi, and two in resorption of the proliferations, leaving well marked cicatrices.

DeWecker, in DeWecker's Handbuch der Augenheilkunde, Vol. IV, page 516-517, speaks of the rapid manner in which the disease develops. He refers to a patient where in the course of eight days, a growth of the size of a bean developed which pressed one-third of the iris forward against the cornea. The absorption of this growth was very rapid, as it disappeared entirely in three or four weeks under specific treatment.

Dr. Francis Delafield in the transactions of the American Ophthalmological Society, 1871 reports two cases of general syphilitic inflammation of the eye occurring in negroes.

In the first case the man had primary and secondary symptoms and the eye complication followed very rapidly. It was not enucleated for six months after the first evidences of inflammation manifested themselves. There was then an annular staphyloma involving the entire ciliary zone. He says, "The growth was firm and composed of fibres with round and fusiform cells, near its centre it was softer, the cells more numerous and many of them broken down."

In the second case there was a history of syphilis followed by iritis of both eyes, and when he was examined there was found in the left staphyloma of the sclera at the lower and inner margin of the cornea. There were also complete posterior synechiæ of the iris with exudation in the anterior chamber. The eye was enucleated, and the following is taken from the

microscopic report: "That portion of the sclera which formed the staphyloma contained many lymphoid cells between its fibres, and at the apex of the staphyloma the fibres disappeared and nothing but cells could be seen."

In the proceedings of the American Ophthalmological Society for 1874, page 175 is the report of a case of "Syphilitic Gumma in the Ciliary Body," by Dr. Edw. Loring and H. C. Eno. It was in the person of a well developed woman of thirty years of age who had had a chancre five years before. She had the usual secondary and tertiary symptoms. Three years before the enucleation she had an attack of iritis in both eyes. The present attack associated with sudden and very severe pain was very violent, and destroyed the sight of the left eye within a day or two. It was enucleated and a microscopic examination made by Dr. Eno from which the following is taken:

"As seen in this section the episcleral tumor is about $1^1/_2$ millimeters in thickness and extends nearly back to the equator of the eyeball inclosing in its substance the tendon of the rectus externus. The anterior chamber is filled with a mass of yellowish exudation completely blocking up the pupil. The ciliary tumor is of quite firm consistence and yellowish in color. It extends backward to the region of the ora serrata where it is gradually lost in the choroid, which appears to be slightly increased in thickness.

Microscopic examination shows that the episcleral tumor is due to an infiltration of the episcleral tissue with a multitude of round cells.

The cells are distributed between the fibres of the connectissue, and the blood-vessels of this region are enlarged and engorged."

The right eye remained free from any inflammation for two or three weeks after its fellow was attacked and then became painful and sensitive to light. "Four days after the enucleation of the left eye a small circumscribed elevation began to make itself apparent in the line of the insertion of the rectus externus but somewhat closer to the cornea. This hae the appear-

ance of a circumscribed elevation of the subconjunctival tissue, the conjuuctiva proper being but slightly injected just over it." Later on a greyish spongy exudation began to be apparent over that part of the iris opposite the insertion of the externus rectus which in time extended over two-thirds of its surface and projected over its edge into the pupillary space. Vision was reduced to counting fingers at 8 inches.

Under vigorous specific treatment this exudation disappeared so rapidly that within thirty-six hours the anterior chamber was again free and vision greatly improved and the eye made a steady and rapid recovery.

Dr. Seggel of the German Army reports a case of iridochoroiditis gummosa in vol. XI of Archives of Ophthalmology. It occurred in the person of a private in the Bavarian Infantry. He had constitutional syphilis for which he was admitted into the hospital. In a short time the right eye became sensitive to light and painful to pressure and a diagnosis of iritis was made. Within a few days a projection of the sclerotic at the external margin of the cornea was manifest. It was associated with intense photophobia and great tenderness to touch. The iris was now discolored and bound down by many adhesions.

The following descriptions is given: "The scleral projection now presents the following appearance: 4 millimeters from the lateral corneal border, a short distance above the horizontal meridian, the sclerotic projects nearly hemispherically, with a base of three and an elevation of rather more than two millimeters, so that under the movable conjunctiva, though the vascular injection was here most pronounced, the sclerotic is translucent with a light bluish coloration. Despite the great tenderness, it may be demonstrated that the crest of the prominence is not compre sible, and that the resistance is somewhat increased."

The treatment consisted in the use of mercurial inunctions, atropine and cataplasms. The result was most favorable. The growth was rapidly absorbed and the eye returned to perfect vision.

Dr. Conner, of Detroit, in a brochure on syphilitic diseases of the eye on page 9, mentions a case of specific iritis involving both eyes, where there was a swelling at the outer and lower side of the sclero-corneal junction of the right eye. The growth increased in spite of active treatment, and finally enucleation of the globe was necessary.

Although no microscopic examination was made, yet the history of the case and the development of the tumor in the ciliary region all stamp it as belonging to the class of gummata.

In *Archives of Ophthalmology*, 1877, page 318, Dr. A. Alt, of St. Louis, reports a case of an Isolated Gummous Tumor of the Ciliary Body.

"The ciliary body appeared, macroscopically, very much thickened. The microscopic examination revealed the following: Especially the anterior half of this single ciliary body is much thickened by an accumulation of round cells. These round cells show all the peculiarities of the white blood corpuscles. They are more crowded in the centre of the tumor, and are there decaying into fatty detritus. There are no vessels in the new-formation.

The muscular fibres apparently take no active part in the formation of the growth. They are crowded aside by the round cells. In specimens taken from the centre, only a small number of atrophic fibres lie anteriorly to the tumor, (Pl. III, fig. 15) most of them are crowded backward. In specimens taken from the periphery, the number of muscular fibres is increased by those of the centre, which were pushed aside.

There is, besides, purulent iritis and choroiditis and a hæmorrhagic purulent exudation into the vitreous body.

The anotomical condition, united wite the clinical diagnosis, do not allow any doubt as to the gummous nature of the tumor. It, however, is only one symptom of a general specific purulent panophthalmitis.

Theodore Von Schroeder in an inaugural dissertation on syphilitic iritis, 1880, relates a case of a patient 25 years old,

who after specific infection had inflammation of the right eye. There was extensive episcleral injection, and in the upper and outer quadrant a sclerectasia of the size of a small pea.

The eye was extremely painful. Mercurial treatment was carried out but in spite of all the vision faded away and finally the eye became soft and atrophied.

He also records a case in a female aged 20, where after specific manifestations the right eye became involved. There was a sclerectasia directly above the cornea. There was violent pain and photophobia and marked turbidity of the aqueous.

There was a grayish yellow exudation into the anterior chamber which was absorbed. The final result under energetic treatment was a partial recovery of vision.

The most interesting feature of this manifestation of syphilie is the rapidity of its development and its equally rapid absorption. In the cases mentioned be DeWecker, Drs. Loring and Eno and Dr. Seggel the development of the ciliary gumma occurred within from two to eight days. And where resorption took place in favorable cases related by them as well as by others, it was accomplished in a remarkably short time.

In the left eye of Laura Corbin, it is possible that resorption might have taken place under energectic treatment and the eye have been saved to useful vision, but there was severe pain, increased intra-ocular tension and a thinning of the sclera at the point where the gumma was located. I did not think it prudent to risk the action of internal remedies alone.

The paracentesis in the case had the desired effect, and it is quite probable that similiar treatment of the right eye might have saved it also.

We might naturally ask why the ciliary body is not more frequently attacked, especially when we not infrequently see condylomata of the iris. It would seem probable that the ciliary body and choroid may be involved to a limited extent without producing any thinning of the sclera and thus escape observation.

A case like this occurred to my associate Dr. Sattler, where after a violent attack of specific iritis had subsided, there was a bluish spot in the sclera which probably marked the location of a gumma which had escaped observation during the severity of the attack on account of the marked injection of the conjunctival and subconjunctival tissues.

SEVEN CASES OF INSUFFICIENCY OF THE INTERNAL RECTI MUSCLES IN WHICH TENOTOMY OF THE EXTERNI WAS PERFORMED BY DR. C. R. AGNEW.

RFPORTED BY DR. D. WEBSTER, NEW YORK.

Clinical contributions to the subject of the treatment of insufficiency of the ocular muscles have not been so plentiful, in the last few years but that reports of cases of the same will be read with some interest. It will be observed that in the seven cases herewith reported the insufficiency of the interni was of a high degree, in five of the cases being no less than 13° or 14° at 20′, and in the other two no less than 3° or 4°. In five of the cases the right externus only was cut, in a fifth the left externus only, and in the remaining case both externi were divided, the interval between the operations being about eight weeks. In three of the cases the refraction was myopic, while in three it was emmetropic or hypermetropic. In one case one eye was myopic, while the other was emmetropic.

One of the most satisfactory results was in a case of myopia, in which, at the last testing there was an over-correction of the insufficiency to the extent of some 10°. For a number of years Dr. Agnew operated for insufficiency somewhat infrequently, first, because of the difficulty of producing exactly the effect desired by the operation then in vogue, and secondly, on account of the too often resulting restriction of the movement of the eyeball toward the side of the cut muscle.

In the later years of his life he performed many tenotomies for insufficiency which I hope to report at some future time.

Case I.—S. A. B. æt, 38 years, physician, came to Dr. C. R.

Agnew, Nov. 28, 1873, on account of a severe asthenopia. He had suffered from "spinal irritation" since the age of eighteen, and for some time past attempts to read or write continuously had produced so much smarting and blurring and so much nervousness that he was compelled to stop. Ophthalmoscopic examination showed that the media and fundus were normal in both eyes.

R. V.=$^{20}/_{XX}$; Hm. $^{1}/_{LX}$.

L. V.=$^{20}/_{XX}$: Emmetropic.

Insufficiency of interni 4° at 20′; 15° at 1′. May 25, 1874. Insufficiency of interni 2°—4° at 20′, 14° at 1′. May 26. Muscular tests give the same results.

Dr. Agnew now divided without anæsthetic the externus of the right eye leaving but a shred of its insertion uncut, and closed the conjunctival wound with a stitch.

May 27. Removed the stitch.

May 28. No inflammatory reaction.

Insufficiency of externi 1° at 20′, and of interni 5° at 1′.

June 1. Insufficiency of interni 4° at 1′, no insufficiency at 20′.

June 11, 1875. Insufficiency of interni 6° at 1′, none at 20′. The cicatrix following the tenotomy became inflamed and painful soon after his return to his practice, and has remained so ever since, and his asthenopia is unrelieved.

Oct. 3, 1880. Insufficiency of interni 3° at 20′ and 16° at 1′.

Nov. 15. Has taken since the last visit, a teaspoonful of Price's glycerine before each meal by Dr. Agnew's advice, and by the advice of Dr. H. D. Noyes, who saw him in consultation, the following:

℞	Sodii Bromidi - - -	℥ij
	Ammon. Bromid. - - -	℥i
	Sodæ bicarbonat. - - -	℥ij
	Infus. Columbæ - - -	℥viij

M. S., a teaspoonful in water thrice daily.

During this period he has gained ten pounds in weight, and at first his asthenopic symptoms were relieved, but after a while typical bromism with paresis of limbs, tipsy feeling in

head and partial aphasia set in, and then his asthenopia became as bad as before.

Sept. 17, 1887. The patient is again under Dr. Seguin's care, who refers him again to us to see if the condition of his eyes can be improved. Examination shows normal fundus and media, both eyes. Abduction 6°, adduction 12°, no insufficiency.

R. V.=$^{20}/_{XV}$+; Emmetropic.

L. V.=$^{20}/_{XX}$—; $^{20}/_{XV}$+with—0.25 D. axis 90°.

His reading glasses are, Right+3.50 D., Left+2.75 D. I found on trial that he read more comfortably with Right+3. D., Left+3. D.⌒+0.25 D. axis 180°, and so ordered them. The patient says that Dr. W. A. Hammond has examined him and tells him that he has hyperæmia of the brain. He is uncertain as to whether he was benefited by the tenotomy of his externus.

Case II. Miss T., æt. 36, teacher, was referred to Dr. C. R. Agnew by Dr. John C. Minor, on July 3, 1874. At the age of 15, while at boarding school, she had strained her eyes, and had developed myopia with asthenopia. She got concave glasses, and her asthenopia was partially relieved. At the age of 26 she found that her eyes were losing their power of endurance, and they have grown gradually worse until now she cannot read longer than three minutes, "especially if there is any thought in it."

Ophth: No staphyloma posticum of either eye.

R. V.=$^{7}/_{CC}$; $^{20}/_{XXX}$+with—$^{1}/_{8}$.

L. V.=$^{7}/_{CC}$; $^{20}/_{XXX}$+with—$^{1}/_{8}$.

Insufficiency of interni 4° at 20′, and 20°—25° at 1′.

July 7. Insufficiency of interni 4° at 20′, and 17° at 1′.

July 8. Tenotomy of right externus under ether.

July 10. Patient was kept awake the last two nights by an itching eruption which she calls "the hives," and which was produced by the ether. She complains of homonymous diplopia.

July 11. Insufficiency of externi 10° at 20′; none at 1′.

July 14. Insufficiency of externi 17° at 20′.

July 27. The diplopia is gradually wearing away, but there is still severe pain on reading. Insufficiency of externi 6° at 20′, none at 1′.

July 2, 1875. The patient states that she was troubled with double images for more than two months. She could use her eyes for reading, sewing, etc., with pleasure long before the diplopia passed off. She got rid of the sense of constriction. She can now use her eyes five or six hours a day. She still has double images when she looks to the right. Insufficiency of externi 10° at 20′; no insufficiency at 1′.

Case III. Dr. W. S. had tenotomy of his right externus by Dr. Agnew on May 10th, 1875. Before the operation he had insufficiency of his interni 13° at 20′ and 30° at 1′. Ether was administered for this operation. On the 27th of the following October his insufficiency of the interni was 7° at 20′ and 12° at 1′. His asthenopia, though not cured, was considerably relieved. On April 19th 1876, he had insufficiency of interni 8° at 20′ and 13° at 1′. He was afterwards placed under atropine and fitted with glasses correcting a considerable degree of hypermetropia and with still further improvement.

Case IV. C. L. C., æt. 23, consulted us on January 21, 1876, on account of myopia with severe asthenopia. His near-sightedness was discovered when he was fourteen years old, from his inability to recognize his acquaintances across the street. His father is a clergyman with one defective eye and two of his maternal aunts are near-sighted. He was fitted with glasses by a distinguished ophthalmic surgeon at the age of nineteen.

R. V.$=^{20}/_{LXX}$ with$-^{1}/_{9}$ s.

L. V.$=^{20}/_{L}$ with$-^{1}/_{6.5}\bigcirc-^{1}/_{30}$ c. axis 90°.

Insufficiency of interni 14° at 20′, 29° at 1′.

The ophthalmoscope shows slight staphyloma posticum with pigment changes in the fundus of both eyes.

January 22. Tenotomy of external rectus of left eye, under ether, by Dr. C. R. Agnew.

January 24. Homonymous images at 20′ made to blend by a prism of 5° base out. Has single vision at 2′.

January 26. Homonymous images 4° at 20′.

Feb. 10. Insufficiency of interni 4° at 20′, 20° at 1′.

Feb. 25. R. V.=$^{20}/_{LX}$ with—$^{1}/_{8}$ s.

L. V.=$^{20}/_{L}$ with—$^{1}/_{8.5}$ s. ⌒— $^{1}/_{30}$ c. ax. 90°.

Insufficiency of interni 10° at 20′, 30° at 1′.

March 3. Insufficiency of interni 8° at 20′, 25° at 1′.

April 28. Patient writes—"My eyes are better but the gain has been slow, as I have not been well. I see singly at 1′ or 20′ and nearly so at greater distances, but my eyes are very weak yet."

May 13. Insuf. Ext. 3° at 20′.

Insuf. Int. 4° at 1′.

R. V.=$^{20}/_{XL}$ with—$^{1}/_{9}$ s. ⌒—$^{1}/_{30}$ c. axis. 90°.

L. V.=$^{20}/_{XL}$ with—$^{1}/_{7}$ s. ⌒—$^{1}/_{30}$ c. axis. 90°.

May. 15. Ordered glasses as last above. Patient not since heard from.

Case V. Miss C. L., æt. 26, a teacher of articulation for mute children, consulted us April 15, 1876; for asthenopia. Her eyes had never been very strong, but had given her great trouble in the last two years. V.=$^{20}/_{XXX}$ each, and no improvement with glasses. No lesion of media or fundus.

Insufficiency of interni, 16° at 20′, 23° at 1′.

April 18. Insufficiency of interni 14° at 20′, 19° at 1′.

Tenotomy of left externus under ether.

April 22. Insufficiency of externi 3° at 20′, and of interni 7° at 1′.

May 1. No insufficiency at 20′ nor at 1′.

May 23. Insufficiency of interni 13° at 20′, 16° at 1′.

The left eye got inflamed a week ago, then got better, but the inflammation came on again yesterday, and the eye was so painful last night that she could not sleep.

Ordered atropine and coquilles to be used daily.

May 29. Insufficiency of interni 15° at 20′, and 7° at 1′

June 8. Tenotomy of right externus under ether.

June 12. Homonymous images 3° at 20′. No insufficiency at 1′.

Sept. 14. No insufficiency for near or far as tested by col-

ored glass and prisms. Saw double on looking to the right, at times, during the summer, but in no other direction. Has no diplopia now and asthenopia is relieved.

CASE VI. Miss Jeannie E., æt. 17, came complaining of headache, pain in the back of eyes and burning sensation in eyes on reading intently. She had been suffering in this way for four or five years. There was history of hereditary eye troubles.

R. V.=$^{20}/_{XX}$ with—$^{1}/_{12}$ s. ⌒—$^{1}/_{70}$ c. axis 100°.

L. V.=$^{20}/_{XX}$ with—$^{1}/_{10}$ s. ⌒—$^{1}/_{60}$ c. ax. 90°.

Insufficiency of interni, 13° at 20′, 27° at 1′.

Ophthalmoscopically no lesion except slight staphyloma posticum of both eyes.

Dec. 6, 1875. The patient was placed upon atropine and smoked coquilles, the former to be dropped into the eyes night and morning.

June 8, 1876. Insufficiency of interni 10° at 20′, 26° at 1′.

June 16. Tenotomy of right external rectus under ether.

June 26. Insufficiency of externi, 10° at 20′, 4° at 1′.

Patient is troubled with double vision.

June 30. Insufficiency of externi, 8° at 20′; none for the near.

R. V.=$^{20}/_{XX}$ with—$^{1}/_{11}$ s. ⌒—$^{1}/_{48}$ c. axis 90°.

L. V.=$^{20}/_{XX}$ with—$^{1}/_{11}$ s. ⌒—$^{1}/_{60}$ c. axis 45°.

Ordered as last above to wear all the time.

CASE VII.—Eugene D., æt. 31, stenographer, greatly overworked, consulted Dr. Agnew on March 22, 1875, for asthenopia. There was well-marked occasional divergent squint of his right eye, but no diplopia, except when brought out by prisms and colored glass.

R. V.=$^{6}/_{CC}$; no improvement with glasses.

L. V.=$^{20}/_{XX}$; E.

April 3. Insufficiency of interni 20° at 20′, and 45° at 1′.

Insufficiency Rt. superior rectus 10°.

The patient was placed under ether and the right external rectus as thoroughly divided as possible. The conjunctival

wound was closed by a stitch and the eyeball strongly rotated inward by a guy to the internal canthus.

April 4. Removed the guy and the conjunctival stitch.

April 12. No lateral deviation.

Insufficiency of right superior rectus 13° at 20′, 10° at 1′.

July 14. R. V.=$^{10}/_{cc}$ with —$^{1}/_{3.5}$; reads J. No. 3 without a glass. Ordered—$^{1}/_{4}$ over right eye and opaque glass over left eye, to use a little every day.

March 21, 1879. For several months past, eyes have become intensely fatigued on use, and this tendency to fatigue is increasing.

Notwithstanding the tired feeling he has been, all along, using his eyes some eighteen hours a day for stenographic purposes.

L. V.=$^{20}/_{xl}$; $^{20}/_{xx}$ with —$^{1}/_{48}$.

Ophthalmoscopic examination shows a hyperæmic optic disk, reddened and blurred. Ordered rest and colored glasses.

March 26. L. V.=$^{20}/_{xxx}$; $^{20}/_{xx}$ with —$^{1}/_{72}$.

Ordered pills of strychnia gr.$^{1}/_{50}$ each; one three times a day.

May 9. After atropine, eight grain solution, had been dropped into both eyes three times,

R. V.=$^{20}/_{cc}$ with —$^{1}/_{4}$.

L. V.=$^{20}/_{xx}$ with —$^{1}/_{72}$.

The patient was not seen again until August 20, 1881, an interval of two years, when,

R. V.=$^{20}/_{cc}$ with —$^{1}/_{4}$.

L. V.=$^{20}/_{c}$; $^{20}/_{xx}$ with —$^{1}/_{36}$.

He complains of "a feeling as though he were using somebody else's eyes," a sudden blurring and then recovery of vision. Ordered —$^{1}/_{36}$ for the distance.

This patient, it will be observed, turned an apparently emmetropic eye into a myopic one from over-work, while under observation. He was one of the most expert stenographers living and his services were greatly in demand. The consequence was, that his good eye was in constant near use during nearly all his waking hours. The case illustrates very well, the de-

velopment of nearsightedness from too steady and prolonged use of the eyes for near work. It also illustrates the fact that an eye amblyopic from disease may have its vision improved by daily exercise of the organ. The sight of the right eye of this patient was increased from $^{6}/_{cc}$ to $^{20}/_{cc}$ in this way.

I consider it extremely probable that the myopia of this patient's right eye was congenital. So far as he could tell, it had been in its present condition since his earliest recollection. If then this patient was born with a highly myopic right eye there was, probably, a tendency, or hereditary predisposition to myopia in the left as well, and this would help to account for the production of myopia from overuse at a mature age.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, JUNE 14, 1888.

J. W. HULKE, F.R.S., PRESIDENT, IN THE CHAIR.

From The British Medical Journal.

Paralysis of the Fifth Nerve Associated with Cataract.—DR. W. COLLINS showed a case of paralysis of all parts supplied by the sensory branches of the right fifth nerve; muscles of mastication unaffected. No history of syphilis and no cerebral symptoms. The patient had suffered from severe pain in the anæsthetic parts for eight months and the sight of the right eye had failed. There had been no herpes and no conjunctival or corneal affection whatever. There was diffuse opacity of the right lens; the left eye and side of the face were normal, and vision was good. He considered that the lesion was located somewhere between the root of the nerve in the pons and the subdivision of the Gasserian ganglion. This case conflicted with the views of Snellen and others respecting trophic nerves. Here the lens, non-innervated, and protected from foreign irritants, suffered, while the highly-innervated and anæsthetic cornea retained its pellucidity, notwithstanding eight months habitual exposure.—MR. T. PRIDGIN TEALE mentioned a case of cataract, in which puncture of one lens was followed by suppuration of the globe. The patient died shortly afterwards with aphasia, due to cerebral hæmorrhage, which was not entirely recent but partly resulted from an accident many months previously. He suggested that the disastrous results to the eye might have been the result of the nervous lesion.

Exostosis of Frontal Bone and Orbit with an Intracranial Growth.—DR. EMRYS-JONES mentioned a case, and showed specimens of a large orbital exostosis associated with a myxo-

matous tumor in the anterior lobe of the brain. There had been some epileptiform attacks, the existence of which the patient denied on account of his anxiety to have the growth removed. The attempt at removal had to be abandoned and the patient died five days later from septic meningitis.—MR. JONATHAN HUTCHINSON had seen several cases of exostosis of the frontal bone. In one case of a young man the exostosis grew into the frontal sinus on the left side and was removed by trephining; later on there grew another exostosis from the right side which was early removed, but septic inflammation and death followed. In another case of a young woman the exostosis was very large, and a long time was spent and many saws were used in attempting to remove the growth, but only with partial success, a raw surface with bony base being left; this suppurated and remained open for twelve months, when further surgical interference led to the shelling out of the remaider of the exostosis, a deep cavity was left, at the bottom of which some mucous material was seen, but the dura mater remained sound; the eye had been previously lost, ultimately the case did well and the wound healed.—THE PRESIDENT said these cases pointed to the great risk of interfering when the cranial wall was perforated. He referred to two cases where the inner table only was involved, the roof of the orbit being free, in which removal of the exostosis was quite easy.

Optic Atrophy in Three Brothers (Smokers).—MR. EDGAR BROWNE (Liverpool) read a paper on this subject. In the first patient, aged 40, vision had failed at the age of 27. A diagnosis of tobacco-amblyopia was made. The patient reduced smoking gradually, but continued to chew. Vision had steadily failed to shadows, but the pupils were three millimetres diameter, acted to light, and the patellar reflexes were good. Previously, vision was good; general health always good. Optic discs, typical skim-milk atrophy, with attentuated vessels. He could see a flame or bright reflection from white at periphery of fields. The second patient was aged 33; sight became very bad six months before; he also both smoked and chewed tobacco; he could see a little in twilight. The knee-

jerk was good. Pupils, three millimetres diameter, acted to light. The optic disc showed a general appearance of atrophy; vessels pervious, but rather small. He could see white paper test in lower temporal (right) and lower nasal (left) fields, but not at all centrally. In the third patient vision had failed for two years, patient being aged 23; could read J. 16. This patient discontinued smoking when warned. Pupils sluggish, but acted to light. Peripheral fields for white, both eyes normal; central scotoma for white and red in left eye, for red only in right; color vision with wools good. Optic discs very white and smooth; veins perhaps a little large. The original assumption, that tobacco could cause atrophy had been rather discredited since the significance of axial neuritis had been understood. These cases were closely related to the hereditary optic atrophy of Leber (though occurring rather late), but the term hereditary should not be adopted till our information was much more exact. In all three cases, tobacco was probably the determining cause of the atrophy. In all perception of light was better towards periphery than centre; none had visible neuritis; none had cerebral or spinal symptoms. The father, mother, and sisters had good sight; a collateral relation had suffered. These cases might be taken as types of one group—namely, those in which an axial neuritis being once established tended to spread to the peripheral fibres, involving both sets in the subsequent atrophy. Exactly the opposite occurred in ordinary neuritis, in which the central fibres (and vision) might escape for a time. The following grouping of cases was suggested: 1. Ordinary tobacco-amblyopia, involving only central fibres; transient, and recovery on removal of the cause. 2. A class beginning with central negative scotomata, which progressed downwards till central defect became positive (or nearly so), and axial atrophy might be assumed, peripheral vision being unaffected. The part played by tobacco in these cases required investigation. 3. Cases like those under consideration, where retro-bulbar neuritis, beginning centrally, spread peripherally, giving rise to more or less pronounced atrophy. Here the personal procliv-

ity was show in young persons, members of the same family. If similar groups were found among non-smokers, search would not be required to discover the exciting agent. Beyond these were (4) consecutive atrophy, and (5) atrophy accompanying spinal degeneration. At present the two last groups were well understood, but cases illustrating the second and third groups should be collected.—Mr. Hutchinson mentioned a group of three, consisting of two young males who smoked and the mother of one of them (and aunt of the other) who did not smoke, all affected with optic nerve atrophy. In the case of the woman the inherited predisposition to nerve lesion must have been very strong. Eventually she became quite blind, but had very good health. Perhaps abuse of tea or coffee might have had a share in bringing about this effect; he was sure that they sometimes caused deafness. He thought the Society might investigate the very rare group of women affected with this form of atrophy who did not smoke at all. Mr. Browne had mentioned that his first patient was a total abstainer. This, in his experience, rather led to the production of the atrophy than the reverse; those who indulged in alcohol as well as tobacco were less liable to tobacco atrophy than were abstainers. These cases occurring in families were much more severe, more liable to end in blindness, and much less easily cured than other forms.—Dr. Emrys-Jones mentioned the case of a family of nine children, but only five living, in which two children had atrophy of the optic disc without definite cause, the girl at the age of 17 and the boy aged 9; total blindness ensued.—Dr. Habershon referred to his paper read at a former meeting of the Society, dealing with hereditary cases of optic atrophy; in some a sexual cause appeared to operate.—Mr. Walker thought that great losses of blood and a numerous family in the mother and grandmother might be a cause of optic atrophy in children.—Mr. Browne hoped an investigation, as suggested by Mr. Hutchinson, would be undertaken by the Society. Subjects of tobacco amblyopia had often been drinking heavily; if they left off alcohol and tobacco they did well.

TRANSLATION.

A NEW METHOD OF TRANSPLANTING CORNEAL TISSUE.

BY C. A. VON HIPPEL.

[The interest which the happy results of von Hippel in transplanting corneal tissue have aroused among oculists prompts the translation of an extract from a part of his paper in Graefe's Archives, taken from the *Centralblatt f. prakt. Augenhlk.* This will be the more valuable since certain American publications, sent out with great flourish and in too great a hurry, might be apt to bring discredit to the real achievements of von Hippel.]

Contrary to the opinions of Neelsen and Angeluzzi, the author states positively:

1. That the transplanted flap dies but *very exceptionally*.

2. The nutrition which comes from its periphery is perfectly sufficient to keep it alive. A new-formation of tissue upon its posterior surface forms a disagreeable complication.

3. Even where there is no such formation of tissue, the posterior layers of the flap may get dim, its tissue may swell, and a smaller or larger portion of its epithelium may be cast off.

Peschel, who tried to transplant the cornea of the embryo, was unsuccessful. After shortly speaking of the doubtful method of Martin, the author speaks of Leber's investigations, concerning the current of the fluids in the eyeball, and of the fact demonstrated by him, that a clear cornea can only be expected when Descemet's membrane is intact: He further states, that the implanted Descemet's membrane, on account of the

turning in of its edges, cannot heal together with what remains of Decemet's membrane in the eye operated upon, and from that deduces the rule, that Decemet's membrane must be preserved *in toto.* This idea was made use of by the author in devising partial transplantation of perfectly equal pieces which can be done by the use of the trephine.

It is first necessary to get, by oblique illumination, as exact an idea as possible of the extent of the leucoma in depth, and of the existance of an anterior chamber; furthermore, the author recommends to palpate the cornea carfully with a rubber spatula, after having instilled some cocaine, in order to arrive at some knowledge with regard to the thickness of the different portions of this membrane. It will not always be possible to make the implantation in the centre of the cornea, but where it has to be done excentrically, an iridectomy may, at a later period, complete the success.

The trephine provided with a clock-work, which can be easily set agoing and stopped, (Liebrich's Nachfolger, Giessen, 40 Mark) is so arranged, that by a certain contrivance, it can be prevented from entering too deep into the tissue. In the case operated upon by the author, the thickness of the cornea was one millemetre. The operation is proceeded with in the following manner:

1. Introduction of the speculum; grasping the eyeball on opposite sides with fixation forceps; putting the trephine vertically upon the lencoma, but without pressure,and cutting off the piece which is to be removed. The diameter should not be more than 4 or 4$^1/_2$ mm. This is always followed by hæmorrhage which is stopped by sublimated ice-cold cotton.

2. Removal of the piece of cornea. For this the author uses a strong, straight iris-forceps, with sharp teeth, one branch of which is inserted as deeply as possible into the incision in order to grasp, if possible, the whole thickness of the flap, and stretch it. The removal is done with Graefe's knife. When operating upon the right eye, the autor stands behind the head of the patient. With some training it is possible to get the fundus of the gap pretty smooth, at least sufficiently

so, to allow of the union of the implanted flap. If there are any dim portions left, one should not try to remove them, as not only perforation of the cornea may easily be produced, but also a spontaneous clearing up has been observed. Blood-vessels are not to be dreaded.

3. Excision of a corresponding piece of the whole thickness of a rabbit's cornea. The eye is cocainized. By means of a squint-hook introduced behind the eyeball, it is pressed against the lids as far as possible and fixed in that position. Fixation with forceps alone is not sufficient. If the flap is shifted under the trephine it can not be used. It is, of course, necessary to arrange the trephine so, that it will pierce the whole thickness of the cornea, if there is any iris pigment adherent to the posterior portion of the flap, it must be removed by irrigation with a sterilized 0.6% solution of chloride sodium.

4. Transplantation of the flap to the human eye by means of a rubber spatula—no speculum required. When the hæmorrhage ceases, the flap is laid on the cornea by the side of the defect and slowly shifted into it, taking care to avoid air-bubbles. Finally, a slight pressure is exerted on the flap by means of a spatula, in order to give it a good apposition all over. If the flap protrudes over the level of the cornea it is easily displaced. It is, therefore, best to take young animals with a thin cornea. After the flap has been brought into the proper position it is thinly dusted over with iodoform and the lids are carefully closed, the upper one being lifted over the flap. Both eyes are put under a pressure bandage and remain so for two or three days. After that time the bandage is changed every twenty-four hours. On the sixth day the fellow eye is left unbandaged and the patient allowed to leave his bed. On the eighth to tenth day the eye operated upon is left unprotected.

The following disagreeable accidents may happen: The operator may perforate Descemet's membrane in some place with the trephine. He can then not go on with the operation but he may try it again from 4 to 6 weeks later. It is also best to desist from proceeding with the operation if the position of the

trephine is an oblique one, since this irregularity in the wound cannot be corrected. If the trephine did not enter at least 0.75 mm. deep, the incision is too shallow; this may be corrected by a second application of the instrument. When the operator has grasped too thin a portion of the cornea with the forceps and begun to cut it off, it will be best to allow the wound to heal again. If however Descemet's membrane is perforated while the flap has the correct thickness, the operation may be proceeded with.

One should be very careful not to give the defect thes hape of a funnel. The hæmorrhage has already been spoken of. If the flap is stained with blood, it must be rinsed with a solution of chloride of sodium and meanwhile left lying upon the conjunctiva. If there is any increase of pressure in the anterior chamber and Descemet's membrane is pressed forward into the defect, it is best to puncture the anterior chamber in order to get the flap into a good position.

The following is the process of healing: After 24 hours slight inflammatory changes are seen, the bloodvessels are more injected, the corneal tissue around the flap to the extent of 1 or 2 mm. in width, is dim, slightly swollen and prominent; the flap itself is either perfectly transparent or slightly steamy. The untouched layer of corneal tissue below the flap reflects the light more strongly and if it contained blood-vessels these are more injected. In the course of the first week this injection of the eyeball disappears and the space between the flap and cornea, beginning at the periphery, is gradually obliterated. Neither vasularization nor swelling of the flap occurs. Sometimes small infiltrations are observed near its edge which however disappear rapidly and without leaving a trace. After the third week the process of healing seems macroscopically to be perfect. In 4 cases out of 8 the operation was successful.

The author gained in one case $V=^{20}/_{cc}$, in another more than $^{20}/_{cc}$ in which fingers had formerly been counted at three and two meters respectively. Even in cases in which the operation is notcrowned by success, the newly formed leucoma is more transparent than the old one was.

To sum up:

1. The possibility of the transplantation of corneal tissue with preservation of its transparency, and the result of a sufficient visual acuity is proven.

2. Even when the leucoma affects the whole thickness of the cornea, the transplantation may be tried with hope of success.

3. Totally adhering and prominent leucomata are to be excepted.

4. The operation is absolutely without danger, causes little suffering, and may surely be performed wherever there is any hope of success.